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ABSTRACT

Doing Chemistry is a practical resource for high school chemistry teachers that ties the specifics of classroom chemistry content to teaching practice. This final evaluation focused on the evaluation of workshops for teachers. An 81% return on a survey of the 206 lead teachers who participated in the National Science Foundation-funded Doing Chemistry workshops indicated that within this 18-month period, 90% of those teachers showed the materials to 2,500 colleagues, 50% gave 84 workshops involving 2,600 teachers, and 10% presented the materials as posters or papers to 1,700 colleagues. The acquisition of hardware for use with Doing Chemistry has proved difficult. However, 66% of the teachers who returned surveys had the equipment, and an additional 25% had plans to acquire the equipment. The teachers enthusiastically endorsed the workshops and the workshop leaders. (PR)

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The Dissemination of Doing Chemistry

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Final Evaluation Report

Arlene A. Russell
Alpha-Omega, Inc.

November 1990

SE 053386

The Dissemination of Doing Chemistry

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The Dissemination of Doing Chemistry Final Evaluation Report

Arlene A. Russell
Alpha-Omega, Inc.

Abstract

The dissemination of the Doing Chemistry materials through the workshop training of lead teachers has worked phenomenally well. In the 18-month period following the first workshop, the number of teachers exposed to the Doing Chemistry materials through workshops and papers or poster sessions increased 25-fold. An 81% return on a survey of the 206 lead teachers, who participated in the NSF-funded Doing Chemistry workshops, indicates that within this 18-month period, 90% of those teachers showed the materials to 2500 colleagues, 50% gave 84 workshops involving 2600 teachers, and 10% presented the materials as posters or papers to 1700 colleagues. At the time of the survey, these lead teachers were planning 100 additional workshops and 35 posters or papers. Hardware acquisition has proved difficult. Nonetheless, 66% of the teachers who returned surveys had the equipment, and an additional 25% had plans to acquire the equipment. These teachers endorsed enthusiastically the workshops, the workshop leaders, and the continuing support provided by Professor David Brooks.

The Dissemination Effort

Between January 28, 1989 and January 30, 1990, Professor David Brooks and one of four different high school teachers who had been involved in the production of the Doing Chemistry materials conducted 19 workshops for 206 high school teachers who would become Doing Chemistry lead teachers (Table 1). The workshops were held in 18 different states and at the ChemEd conference in Kingston, Canada. The lead teachers came from 46 States, the District of Columbia and Puerto Rico. In addition 28 observers attended the workshops. Each lead teacher who was trained in a workshop was given the Doing Chemistry videodiscs, a set of Macintosh Hypercard program stacks, and the 620 pages of written materials. As trained lead teachers, they were expected to use the

Doing Chemistry materials to train other teachers to use more laboratory activities in their classrooms.

	Sites	<u>Workshops</u>		
		Dates	# Teachers	Observers
1	Lansing, MI	1/28/89	10	1
2	Vancouver, WA	1/30/89	11	2
3	Raleigh, NC	4/ 1/89	3	4
4	Dallas, TX	4/15/89	11	2
5	Washington, DC	4/29/89	9	4
6	N. Dartmouth, MA	5/19/89	10	3
7	Albany, NY	6/18/89	10	3
8	Chem Ed, Canada	8/15/89	29	-
9	Cincinnati	9/23/89	9	-
10	Columbia, MO	10/14/89	11	-
11	Memphis, TN	10/21/89	9	2
12	Philadelphia	10/23/89	10	-
13	Gainsville, FL	10/28/89	11	-
14	St. Paul, MN	11/11/89	8	-
15	Greeley, CO	11/18/89	9	1
16	Oakland, CA	12/ 2/89	9	1
17	Phoenix, AZ	12/04/89	7	1
18	Chicago, IL	12/09/89	17	3
19	Lincoln, NE	1/30/90	2	-

Table 1

Goals of the Evaluation

Workshops as carried out in this project are labor-intensive and not inexpensive. Are they worth it? Do they work? The evaluation focuses on the impact the workshops have had in disseminating the Doing Chemistry materials. There are three dissemination components: that by the lead teachers, that by the observers at the workshops, and that by the hosts of the workshops. The first component, the survey of the 206 lead teachers who were involved in workshops, constitutes the majority of this report. We have some indication from the free-form responses on their returned surveys and on comments from their administrators, that the

workshops have had considerable impact on the professional development of the lead teachers.

Our survey instruments assessed dissemination through:

the availability of the hardware to use Doing Chemistry both initially available in the school and acquired between the time of the workshop and 10/1/90.

the use by lead teachers of the Doing Chemistry materials in their own classrooms, and

the dissemination effort the lead teachers have made to introduce Doing Chemistry to others through informal demonstrations, through formal workshops, and through presented papers and posters.

In addition, the surveys sent to observers and hosts considered their objectives for participating in the workshops, and their satisfaction with the process.

Survey Design Strategy

We presumed that there would be some, perhaps many, lead teachers who had done less than they think they should have done in disseminating the materials. We wanted to know how large this cohort was. If this group were large and should it have decided not to return the survey, our analysis would be subject to a substantial error. Therefore, the survey items were designed not

only to provide information on the concrete dissemination that had occurred and was planned but also to glean information on the more ephemeral plans of the group that had not done what they felt they had been charged to do. Based on the 81% return of the lead teacher forms we believe we have a representative sample of responses from both those who have actively advocated Doing Chemistry to their colleagues as well as those who have not. The data in the Results section give percentages based on both the actual survey response and on total sample. The latter numbers (in *italics*) are the most pessimistic analysis of the data and provide the minimum dissemination that has occurred.

Survey Administration

The initial survey solicitation, which included a cover letter, questionnaire, and stamped return envelope,* was sent to lead teachers the first week in May. This meant that all teachers had had at least five months to implement or disseminate the Doing Chemistry materials. The initial survey was sent to the school address, which was provided by the teachers during the workshop. A follow-up survey, to those who had not returned the first one, was sent to the home address the second week of June. Each survey included an address label requesting acknowledgement or correction of that address. The survey to the school address elicited 120 responses, 51 were returned from the follow-up solicitation, Several responses crossed in the mail with the follow-up survey; 4 teachers returned both surveys. In order to get the teacher's attention to the survey and not to have the envelope thrown away

*All survey instruments are included in Appendix I.

without being opened, we sent the initial survey in the philatelic hologram envelope. Based on comments from some teachers, this appears to have been a successful effort; teachers have told us they have saved the envelope. It may have back-fired, however, in some cases; one lead teacher returned his questionnaire late with an apology that a colleague had intercepted the mail because of the envelope. Follow-up surveys were sent in regular envelopes. While most questionnaires were returned in May and June, some arrived in July as teachers were cleaning up their desks at the end of the school year, and some arrived in late August and September when teachers returned to school and started cleaning their desks. These late returns all indicate recent (over the summer) equipment acquisition.

Survey Results - Lead Teachers

Response

As of 10/1/90, 167 completed surveys were received. One additional survey, from the second mailing, was returned incompletely filled out with a claim that the earlier survey had been returned. We have no record of its receipt.

Another survey was returned by the recently widowed spouse of one of the lead teachers. Table 2 gives the summary percentages.

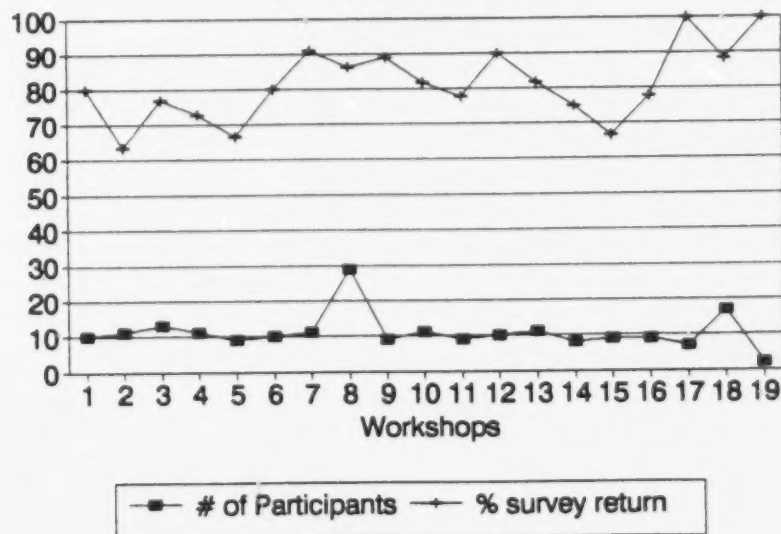
Survey Response

# lead teachers	206
surveys returned	167
% response	81%

Table 2

Before carrying out total sample analysis we considered the correlation of response with workshop. As can be seen in Figure 1 there is a slight, but not significant, negative correlation

Figure 1
Survey Response



between response rate and the length of time since the workshop. The response varies between 100% for the workshops held in Phoenix, AZ and Lincoln, NE and 64% for the workshop held in Vancouver, WA.

Availability of Hardware

At the time of the survey,	<u>Videodisc Players</u>		
111 teachers had videodisc	Available Now	111	66% (52%)
players available, 60 with a	Installed Base	75	45% (36%)
Macintosh interface. It is	Acquired	36	22% (17%)
interesting that 75 of these	Plan 1st Purchase	41	25% (20%)
players were in the schools	Plan 2nd Purchase	18	11% (9%)
before the teachers participated	No Purchase Plans	15	9% (7%)
in the Doing Chemistry workshop.			

This implies that the 'installed base' of videodisc players in high schools could be as high as high 45%! If this is the case, then many of the arguments presented against developing videodiscs are simply not valid.* It is true, however, that the remaining 55% of the teachers have struggled to acquire equipment. The narrative comments indicate some of the creative ways the teachers have tried to acquire equipment. To their credit an additional 39 teachers have already been able to obtain a videodisc player and the equipment. Several schools are planning to acquire additional videodisc players specifically for Doing Chemistry. There are a variety of videodisc players in

Table 3

*We have recently heard that the Commissioner for Education in Florida has provided funds for a videodisc player in every school (K - 12) in the State

use; but it seems that those newly purchased for Doing Chemistry are Pioneer 4200's. (Table 4)

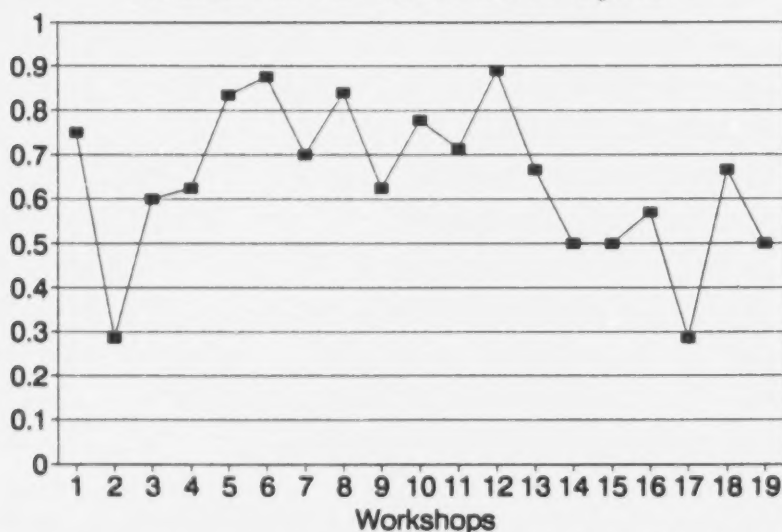
With the exception of the ChemEd conference, which we will discuss later, each workshop represents a distinct area of the country. Pooling the data of all respondents hides variations in the availability of videodisc equipment in different States. Figure 2 shows the fraction of the teachers in each workshop who reported having videodisc players.

Videodisc Models

Pioneer LDV-4200	24
Pioneer (no model #)	14
Pioneer LDV-2000	5
Pioneer LDV-2200	3
Pioneer LDV-6000	3
Magnavox	2
Sony	2
Pioneer LDV-4100	1
Pioneer LDV-6010A	1
Fisher	1
JVC	1
Hitachi 9600	1
Panasonic	1

Table 4

Figure 2
Fraction of Teachers with Players



The paucity of equipment in Washington and Arizona is significantly different than in other regions of the country. This is not a

reflection on the lead teachers in these workshops. All respondents from Arizona indicated they are planning to acquire the equipment; most from the Washington workshops said likewise. There are, however, signs of differences. Whereas, for Arizona, we surveyed the lead teachers before a full fiscal year had elapsed after the workshop, this is not true for Washington. In this case, eighteen months elapsed between the workshop and the survey. One can only conclude that the lag time for equipment acquisition is much greater in this State than in others; several free-form responses from this workshop mentioned budget crunches. The difference is even more stark when one looks at the availability of videodisc players that the ChemEd teachers have available. This sample represents teachers from 20 States, with none from Washington or Arizona. The problems the Washington teachers have, however, are not unique. In the free-response narrative section of the survey, 28 teachers specifically asked for assistance in acquiring hardware either through grants, loans, letters of support to districts, or help in proposal writing.*

Some, but fewer teachers, expressed difficulties in acquiring Macintosh computers. The majority of the teachers who have videodisc players also have a computer. Of these teachers, 60 reported having a Macintosh computer available, and an additional 30 reported other interfaces. The most commonly reported other computers were the Apple IIe (16) and IBM (7) computers. In the

*At approximately the same time our survey was sent, D. Brooks sent each lead teacher's supervisor a letter supporting the teacher's efforts and participation in Doing Chemistry. Responses he received from teachers and supervisors indicate that his letter provided the impetus for several districts to acquire the hardware for the teachers.

narrative section several teachers expressed some uncertainty about hooking up a computer to the videodisc player. Clearly, they had not dealt with this level of technology before, and there was some apprehension. More workshops on the technology, and/or more written instructions on this aspect were mentioned several times. On the other hand, many teachers were secure in this new technology knowing that they could call David Brooks any time they had a problem. Clearly, in the workshop he had given many teachers confidence to 'stretch' their use of teaching methods and take advantage of resources they had previously shunned.

Use of Doing Chemistry Materials

Whether or not teachers had the videodisc and computer equipment, the majority, 117, used some of the experiments. Use varied from 'I do about 2/3 of these experiments anyway, the only new one I attempted this year was E03' to 'too many to mention' and 'many from all discs'. Of those teachers, 91 cited all or partial frequency of use of the various experiments. Table 5, shows the initial overall experiment use; the microscale experiments are "boxed". The average cited use for these experiments is 6.14 and for the other experiments is 2.73. This difference is significant at the $p = 0.001$ level. Only two of the non-microscale experiments, "Sodium in Water" and "Methane Combustion in a Can" were used more frequently than the average microscale experiment. In fact, 40 of the 91 responses included at least one of the microscale experiments. This is not to say that the overall selection of materials for Doing Chemistry was specious. All but 17 of the 134 experiments that constitute Doing Chemistry were

EXPERIMENT USE
Microscale Experiments Marked

Expt #	Disc A	Disc B	Disc C	Disc D	Disc E	Disc F
1	2	1	6	2	4	
2	5	4	2	3	3	2
3	2	5	7	4	8	3
4	6	1	8	5	1	
5	9	1	6	3	11	
6	8		9	5	5	2
7	4		4	2	4	
8	3	2	2	3	2	
9		4		5	7	1
10		2	4	2	3	
11		1	1	1		
12				2		
13				6		
14			5			
15			3	2		
16			3	1		
17						
18						
19						
20						
21		1	1	3	3	2
22		1	3	4	7	
23	2		9	1	4	
24	3	4		4		
25	4	3		1		
26			6	2	2	
27	2	3	4		2	
28					14	
29					8	
30			4		4	
31			2		4	1
32					5	
33			1		2	
34			1			
35			2			
36			1			
37						
38						
39						
40						
41	1			1	1	
42	1			4	7	
43	3			3	3	
44	4				2	
45				1	1	
46						
47	3					
48	2					
49	1					
50	3					
51	3					
52						1

cited as being used by at least one lead teacher. Clearly, however, the inclusion of micro-scale experiments, a revision allowed for in the two-stage proposal plan, greatly increased the applicability and usefulness of Doing Chemistry for many teachers.

Doing Chemistry was originally conceived as a resource for in-service training of teachers who were teaching Chemistry out of their field. This concept is too narrow. Frequently, lead teachers mentioned that they had had their student teachers use the materials. Several specifically commented that they felt Doing Chemistry should be integrated into all pre-service curricula, that new teachers need more lab work in their Science Methods courses. ACS, perhaps through local sections, should aggressively pursue the adoption of Doing Chemistry in all teacher training programs in the country.

Classroom use of Doing Chemistry extended beyond the lead teacher in some schools. A few teachers mentioned that their colleagues had used the videodisc materials also; they did not provide the additional experiment frequency use.

Dissemination

Dissemination can be either formal or informal. Informal techniques to get colleagues to use the videodiscs and do more Chemistry laboratory work is just as important as letting teachers in the region in other schools or districts become familiar with Doing Chemistry. Certainly, the effort that one needs to expend to show the materials informally is less than for a workshop or presentation. However, informal discussions provide useful feedback and confidence building before embarking on formal efforts. 151 teachers reported they had informally shown the Doing Chemistry materials to their colleagues. Collectively, they estimated that this involved showing Doing Chemistry to 2480 other teachers. As Figure 3 shows there is no significant difference in the

Dissemination

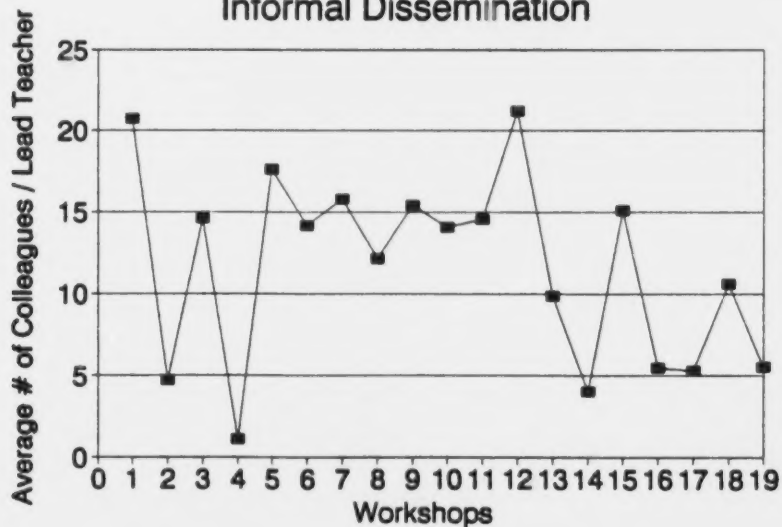
Lead Teachers 151 (90%) (73%)

Colleagues Shown 2480

Watershed X16 X12

Table 6

Figure 3
Informal Dissemination



dissemination efforts of the teachers when the workshop they attended is considered. As noted above these efforts in the local school paid off in some instances. Other teachers were already incorporating Doing Chemistry into their classroom activities during this first year of dissemination.

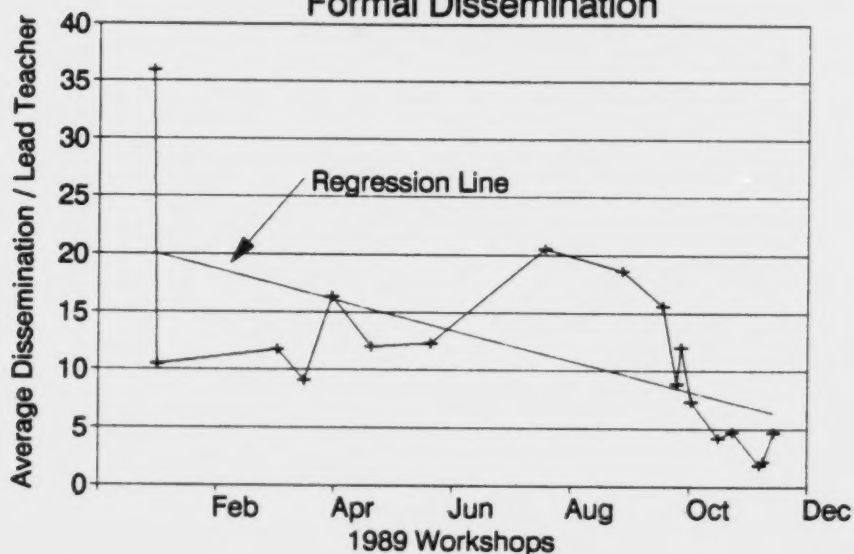
Formal workshops were easier to catalog. To our amazement, in the 18-month period following the first workshop, 84 of the teachers gave workshops. Their estimate of audience size adds an additional 2600 teachers to the dissemination effort. Appendix II summarizes these workshops.

<u>Workshop Dissemination</u>			
Lead Teachers	84	(50%)	(41%)
Audience	2600		
Watershed	X16	X13	
Planned	100	(60%)	(49%)

Table 7

Whereas informal dissemination can occur in the school immediately after the workshop, formal scheduled workshops take time to set up. Figure 4 shows the significantly greater number of contacts made in formal workshops activities by teachers who participated early in the project than by those teachers in the later workshops. This suggests that the measured dissemination would be substantially greater if another survey were conducted next year. It also lends credence to the viability of the planned dissemination activities by the lead teachers. As of May 1, 1990, the lead teachers had scheduled 100 more workshops for the following academic year. Many of these were to be part of district pre-year in-service programs. While not many of the teachers have

Figure 4
Formal Dissemination



been compensated for their efforts, more expected to be paid to give these 'end-of-summer District workshops' than in other cases. If Districts are willing to pay their teachers to give Doing Chemistry workshops it seems logical to assume that they will consider proposals for Doing Chemistry from these newly 'in-serviced' teachers. I would expect a significant number of orders for Doing Chemistry videodiscs in the early Fall. Appendix III describes this planned workshop dissemination effort.

Fewer teachers have given or planned papers or posters on Doing Chemistry than have disseminated the materials through the workshop format. This may reflect a reluctance to write abstracts and schedule talks, an inability to get to meetings, or simply a preference to 'do chemistry'

Poster/Paper Dissemination

Lead Teachers	17 (11%) (8%)
Audience	1670
Watershed	X10 X8
Planned	25

Table 8

than to talk about it. Only 17 teachers reported that they had given papers (several had given papers as a team) and 25 indicated they are planning a paper or poster. The estimated audience for the papers that have been given is 1670.

Finally, we were aware that some of the lead teachers had been asked to show the Doing Chemistry materials at computer shows. This turned out to be a small dissemination element. Only 17 teachers indicated that they had participated in 'computer shows.' Only two indicated that they were sponsored by a computer company - Apple. The others appear to have taken Doing Chemistry to local user groups that they belong to or to computer shows sponsored by their school Districts or local initiatives. Again recompense was seldom provided. Although these efforts do show Doing Chemistry to others, since the audience is more diverse than at workshops, the involvement of lead teachers at these shows is more likely to support the acquisition of videodisc hardware in schools than it is to disseminate Doing Chemistry.

Proof of Dissemination

Ultimately, the success of Doing Chemistry will depend on the continued sale of the Doing Chemistry package. The goal of the dissemination phase of the project was to develop a national cadre of advocates in the lead teachers. Each of the lead teachers was given a set of materials. Was their dissemination little more than showing off new toys or were the teachers really supporters of the concept of videodisc-based teacher training? In the face of many demands on limited funds, did the lead teachers believe in the

worth of Doing Chemistry enough to advocate its purchase by others? Yes! By May 1, 1990, 136 (81%) of the teachers had recommended that Doing Chemistry be purchased; of these 35 (25%) knew that their recommendation had been acted on.

Continuing Needs

Were the one-day workshops sufficient to introduce a new technology to new teachers, albeit excellent ones? To assess general satisfaction with the workshops, the survey asked the lead teachers how the workshop leaders and the ACS could continue to assist them? Overall there was enthusiastic support of the program and many felt a close bond to David Brooks. In some cases this question on the survey evoked very specific needs, "Does any one know how to"; more often the needs were general "financial support for acquiring videodisc players"; most frequently the responses indicated that the lead teachers were already calling David Brooks when they had questions. The free-form responses are tabulated in Appendix V.

The role the ACS played in the dissemination process seemed more distant to many teachers. The question asking for ways that the American Chemical Society could assist them did not generate requests for additional professional development programs as we expected. Most often, the needs were for assistance on acquiring hardware. The comments directed to the ACS are provided in Appendix VI.

General Comments

After having asked about our concerns in the Doing Chemistry dissemination effort, we felt there might be unsolicited issues about which the teachers felt strongly and wished to include in an evaluation. The largest writing space on the survey was provided here, in order not to constrain those who perceived the survey was incomplete. The praise and support for Doing Chemistry in these unsolicited comments should assure any skeptic that Doing Chemistry has been a resounding success. The unedited comments are given in Appendix VII.

The concluding item on the survey was a mailing label that matched the label that we used on the envelope. We had two objectives for this label. The first was logistic; it allowed us to identify easily who returned surveys. The second was administrative. Since we knew that there might be follow-up activities, we asked the lead teachers to correct the address on the label or to provide a different address to keep them informed about Doing Chemistry. We have sent David Brooks a Hypercard stack of corrected addresses.

Survey Results - Observers

The 28 observers in the workshops came from various backgrounds, and attended the workshops for various personal reasons. A 50% response, 15 surveys were received. The respondents heavily favored the post-secondary teachers, however,	<u>Observer Response</u>	
	Workshop Response	
	HS Teacher	11 4 (36%)
	College Faculty	7 6 (86%)
	Tech. Specialist	5 2 (40%)
	Miscellaneous	5 3 (60%)

Table 9

there were not significant differences in the responses by group. Fourteen of the fifteen respondents indicated that the workshop had met their personal objectives. The one for whom it had not, was unhappy that he had not received videodiscs as the lead teachers had. Many of the observers contributed to the dissemination effort. They estimated that they had informally discussed or shown the Doing Chemistry materials to 320 colleagues; they also gave 4 workshops to 80 people. All observers who returned surveys indicated they wanted to be kept informed about Doing Chemistry.

Survey Results - Hosts

The goal of the hosts of the Doing Chemistry workshops was broader than the dissemination of doing Chemistry. The responses on the 9 returned surveys indicate the focus of the host was on the teachers rather than on Doing Chemistry. The workshop provided a vehicle for them to provide high-quality in-service training for their local teachers. Nevertheless, they also wanted to be kept abreast of developments in Doing Chemistry.

Appendix I
Survey Instruments

Envelope Used for Initial Survey Mailings.



Arlene A. Russell, Ph.D.
Orville L. Chapman, Ph.D.

ALPHA-OMEGA, INC.

3930 Mandeville Cyn. Rd.
Los Angeles, CA 90049

(213) 476-5019

May 4, 1990

Dear **Doing Chemistry** Lead Teacher:

The NSF-funded portion of the **Doing Chemistry** Project will end soon. As the Project Evaluator, I need to recommend to the American Chemical Society what they should next do with the Project. We know that the **Doing Chemistry** videodiscs are selling well, but we do not know if they are being used. The workshops, such as you attended last year, were rated very highly when they were given, but we need to know what long-range impact they may be having. Should we schedule more? This is where I need your help. Please take a few minutes to complete the enclosed survey and send it back in the stamped, return envelope.

With final exams, AP's, Achievements, *etc.* looming very close, I realize that the last thing you need at this time of the year is to be asked to do something more. Consequently, the survey is brief; it should not take you more than five minutes to complete. If you have other comments that you feel should be considered by the ACS in terms of future directions and activities for **Doing Chemistry**, we invite you to give us a phone number where you can be reached and a time when it would be convenient for you to have us call. We will build your comments into the report around the impersonal statistics of the survey. Obviously, the report will not identify individuals; both the survey and any phone conversations will be kept confidential.

Thanks for your time and help.

Sincerely,

Arlene A. Russell
Specialist in Chemical Education
University of California, Los Angeles

P.S. We purchased the hologram-stamp envelopes at the Exposition of the recent American Chemical Society meeting in Boston. They are available from the Philatelic Sales Division of the U.S. Postal Service.

Consultants to Chemical Industry and Education

Arlene A. Russell, Ph.D.
Orville L. Chapman, Ph.D.

ALPHA-OMEGA, INC.

3930 Mandeville Cyn. Rd.
Los Angeles, CA 90049

(213) 476-5019

June 11, 1990

Dear **Doing Chemistry** Lead Teacher:

Several weeks ago we sent you a brief questionnaire for evaluating the **Doing Chemistry** workshop that you attended last year. Since we have not heard from you, we do not know whether the mail got through or if you have been too busy to respond. In either case, we hope that you will be able to take a few minutes now to complete this form. It should not take more than five minutes. Please fill it out as you read it and send it back in the stamped, return envelope.

If you have more time and other comments that you feel should be considered by the ACS in terms of future directions and activities for **Doing Chemistry**, we invite you to give us a phone number where you can be reached and a time when it would be convenient for you to have us call. We will build your comments into the report around the impersonal statistics of the survey. Obviously, the report will not identify individuals; both the survey and any phone conversations will be kept confidential.

Thanks for your time and help.

Sincerely,

Arlene A. Russell
Specialist in Chemical Education
University of California, Los Angeles

Consultants to Chemical Industry and Education

Please make any other comments that you have on any aspect of
Doing Chemistry or the workshops.

Doing Chemistry Workshops

Lead Teacher Evaluation

- I. Do you have the facilities at your school to use the videodiscs
you received at the Doing Chemistry workshop?

Yes ____ No ____

If Yes, what videodisc player are you using?

Was this videodisc player in your school when you took
the workshop?

Yes ____ No ____

Do you have the Hypercard/Macintosh interface for using
the videodiscs?

Yes ____ No ____

Do you have any other computer interface for your
videodisc player?

Yes ____ No ____

If Yes, please specify to what computer you have your videodisc player connected.

If No, are there plans to acquire a videodisc player?

Yes ____ No ____

- II. Have you used any of the the Doing Chemistry experiments
and/or written materials in your classroom?

Yes ____ No ____

If Yes, which experiment (s)?

Have any been particularly successful or filled a need
that you had?

Yes ____ No ____

If Yes, which ones?

- III. Have you informally shown the Doing Chemistry materials
to your colleagues?

Yes ____ No ____

If Yes, approximately how many colleagues?
(Please indicate the approximate range.)

(1 - 5), (6 - 10), (11 - 20); (21 - 50), (50 - 100), (+100)

IV. Have you given any workshops using the **Doing Chemistry** materials? Yes ____ No ____

If Yes, (Please complete for all workshops; use the back page if necessary.)

When?

Where?

Approximate size of audience?

Who sponsored the workshop?

Were you reimbursed for your time? Yes ____ No ____

Are you planning to give a workshop? Yes ____ No ____

If Yes,

When?

Where?

Will there be a sponsor? (Please identify.)

Will you receive compensation? Yes ____ No ____

V. Have you presented any papers or posters on **Doing Chemistry**? Yes ____ No ____

If Yes,

When?

Where?

Approximate size of audience?

Do you have any plans to give a paper or poster on **Doing Chemistry**? Yes ____ No ____

If Yes,

When?

Where?

VI. Have you been asked to show **Doing Chemistry** materials at a computer show? Yes ____ No ____

If Yes,

When?

Where?

Did you or will you receive compensation? Yes ____ No ____

VII. Have you recommended to other teachers that they purchase or use the **Doing Chemistry** videodisc series? Yes ____ No ____

If Yes, do you know if any have followed your advice? Yes ____ No ____

VIII. Is there any way that the workshop leaders could continue to assist you? Yes ____ No ____

If Yes, how?

IX. Is there any way that the American Chemical Society can assist you? Yes ____ No ____

If Yes, how?

X. Would you like a follow-up phone call to allow you to elaborate on any of the items in this survey? Yes ____ No ____

If Yes, please indicate a phone number and a convenient time for us to call you.

Phone # _____ (Work)? _____ (Home)?

Time to call _____

ALPHA-OMEGA, INC.

Arlene A. Russell, Ph.D.
Orville L. Chapman, Ph.D.

3930 Mandeville Cyn. Rd.
Los Angeles, CA 90049

(213) 476-5019

May 18, 1990

[Observer Name]
[Observer Address]

Dear

The NSF-funded portion of the **Doing Chemistry** Project will end soon. As the Project Evaluator, I need to recommend to the American Chemical Society what they should next do with the Project. We know that the **Doing Chemistry** videodiscs are selling well, but we do not know if they are being used. The workshops, such as you participated in last year, were rated very highly when they were given, but we need to know what long-range impact they may be having. Should more be scheduled? This is where I need your help. Please take a few minutes to complete the enclosed survey and send it back in the stamped, return envelope.

With the end of the academic year very close, I realize that the last thing you need is to be asked to do something more. Consequently, the survey is brief; it should not take you more than five minutes to complete. Please fill it out as you read it. If you have other comments that you feel should be considered by the ACS in terms of future directions and activities for **Doing Chemistry**, we invite you to give us a phone number where you can be reached and a time when it would be convenient for you to have us call. We will build your comments into the report around the impersonal statistics of the survey. Obviously, the report will not identify individuals; both the survey and any phone conversations will be kept confidential.

Thanks for your time and help.

Sincerely,

Arlene A. Russell
Specialist in Chemical Education
University of California, Los Angeles

P.S. We purchased the hologram-stamp envelopes at the Exposition of the recent American Chemical Society meeting in Boston. They are available from the Philatelic Sales Division of the U.S. Postal Service.

Consultants to Chemical Industry and Education

Please add any other comments that you have on any aspect of **Doing Chemistry** or the workshops. We particularly value your opinion of the workshop you observed.

Doing Chemistry Workshops

Observer Evaluation

I. What were your objectives for observing the **Doing Chemistry** workshop?

II. Were your objectives met?

Yes ____ No ____

If No, please elaborate.

25

Do you wish to be kept informed about **Doing Chemistry**?

If so, please verify that the address below is correct and the best one for sending you information.

III. Do you have access to a set of **Doing Chemistry** videodiscs? Yes ____ No ____

If Yes, please identify your source of materials.

Do you have a Hypercard/Macintosh interface for using the videodiscs?

Yes ____ No ____

If you have another computer interface for your videodisc player, please specify which computer you are using.

IV. Since the workshop have you used any of the the **Doing Chemistry** experiments and/or written materials in a classroom? Yes ____ No ____

If Yes, which experiment (s)?

V. Have you informally discussed or shown the **Doing Chemistry** materials to your colleagues? Yes ____ No ____

If Yes, approximately how many colleagues?
(Please indicate the approximate range.)

(1 - 5), (6 - 10), (11 - 20), (21 - 50), (50 - 100), (+100)

VI. Have you recommended to teachers or administrators that they purchase or use the **Doing Chemistry** videodisc series? Yes ____ No ____

If Yes, do you know if any have followed your advice? Yes ____ No ____

VII. Have you given any workshops on **Doing Chemistry**? Yes ____ No ____

If Yes, (Please complete for all workshops; use the back page if necessary.)

When?

Where?

Approximate size of audience?

Who sponsored the workshop?

Were you reimbursed for your time? Yes ____ No ____

Are you planning to give a workshop? Yes ____ No ____

If Yes,

When?

Where?

Will there be a sponsor? (Please identify.)

Will you receive compensation? Yes ____ No ____

VIII. Have you presented any papers or posters on **Doing Chemistry**? Yes ____ No ____

If Yes,

When?

Where?

Approximate size of audience?

Do you have any plans to give a paper or poster on **Doing Chemistry**? Yes ____ No ____

If Yes,

When?

Where?

IX. Have you been asked to show **Doing Chemistry** materials at a computer show? Yes ____ No ____

If Yes,

When?

Where?

Did you or will you receive compensation? Yes ____ No ____

Arlene A. Russell, Ph.D.
Orville L. Chapman, Ph.D.

ALPHA-OMEGA, INC.

3930 Mandeville Cyn. Rd.
Los Angeles, CA 90049

(213) 476-5019

May 30, 1990

Dear **Doing Chemistry** Workshop Host:

The NSF-funded portion of the **Doing Chemistry** Project will end soon. As the Project Evaluator, I need to recommend to the American Chemical Society what they should next do with the Project. We know that the **Doing Chemistry** videodiscs are selling well, but we do not know if they are being used. The workshops, such as you graciously hosted last year, were rated very highly when they were given, but we need to know what long-range impact they may be having. Should more be scheduled? This is where I need your help. Please take a few minutes to complete the enclosed survey and send it back in the stamped, return envelope.

With the end of the academic year very close, I realize that the last thing you need is to be asked to do something more. Consequently, the survey is brief; it should not take you more than five minutes to complete. Please fill it out as you read it. If you have more time and other comments that you feel should be considered by the ACS in terms of future directions and activities for **Doing Chemistry**, we invite you to give us a phone number where you can be reached and a time when it would be convenient for you to have us call. We will build your comments into the report around the impersonal statistics of the survey. Obviously, the report will not identify individuals; both the survey and any phone conversations will be kept confidential.

Thanks for your time and help.

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Arlene A. Russell
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P.S. We purchased the hologram-stamp envelopes at the Exposition of the recent American Chemical Society meeting in Boston. They are available from the Philatelic Sales Division of the U.S. Postal Service.

Consultants to Chemical Industry and Education

Please add any other comments that you have on any aspect of **Doing Chemistry** or the workshops. We particularly value your opinion of the workshop you hosted.

Doing Chemistry Workshops

Host's Evaluation

I. What were your objectives for hosting the **Doing Chemistry** workshop?

II. Were your objectives met?

Yes ____ No ____

If No, please elaborate.

III. Have you had any feedback from the teachers who participated in your workshop about the effectiveness of the **Doing Chemistry** workshop. Yes ____ No ____

If Yes, please elaborate.

IV. Have you had any feedback from the teachers who participated in your workshop about the usefulness of the **Doing Chemistry** materials. Yes ____ No ____

If Yes, please elaborate.

27

Do you wish to be kept informed about **Doing Chemistry**?

If so, please verify that the address below is correct and the best one for sending you information.

V. Do you have access to a set of *Doing Chemistry* videodiscs? Yes ____ No ____

If Yes, please identify your source of materials.

Do you have a Hypercard/Macintosh interface for using the videodiscs? Yes ____ No ____

If you have another computer interface for your videodisc player, please specify which computer you are using.

VI. Since the workshop have you used any of the *Doing Chemistry* experiments and/or written materials in a classroom? Yes ____ No ____

If Yes, which experiment (s)?

VII. Have you informally discussed or shown the *Doing Chemistry* materials to your colleagues? Yes ____ No ____

If Yes, approximately how many colleagues?
(Please indicate the approximate range.)

(1 - 5), (6 - 10), (11 - 20), (21 - 50), (50 - 100), (+100)

VIII. Have you recommended to teachers or administrators that they purchase or use the *Doing Chemistry* videodisc series? Yes ____ No ____

If Yes, do you know if any have followed your advice? Yes ____ No ____

IX. Have you given any workshops on *Doing Chemistry*? Yes ____ No ____

If Yes, (Please complete for all workshops; use the back page if necessary.)

When?

Where?

Approximate size of audience?

Who sponsored the workshop?

Are you planning to give a workshop? Yes ____ No ____

If Yes,

When?

Where?

Will there be a sponsor? (Please identify.)

X. Have you presented any papers or posters on the *Doing Chemistry* workshop? Yes ____ No ____

If Yes,

When?

Where?

Approximate size of audience?

Do you have any plans to give a paper or poster on the *Doing Chemistry* workshop? Yes ____ No ____

If Yes,

When?

Where?

Appendix II

Date, Location, and Sponsor of
Workshops Given by Lead Teachers

Appendix II

Date Location and Sponsor of Workshops Given by Lead Teachers

Feb 89	East Kentwood HS	Chem Teachers Alliance
Feb 89	Secondary Science Forum Wenatchee WA	Educational Service District office
Mar 89	MSU	MSU Chem Group
Mar 89	Univ of Mich, Dearborn	Metro Detroit Chem Teachers Club
Mar 89	Flint, MI	GMI/Flint Area Chemistry Teachers
May 5, 1989	Clay High School, South Bend, IN	South Bend Community School Corp and State Department of Education
Jun 14, 1989	Andrew's University Berrien Springs, Michigan	(Methods Class)
Jun 89	Portland St. University	PSU
Jul 26, 1989	Butler University	Woodrow Wilson Institute for Teachers of High School Chemistry
Jul 89	Hope College	Hope NSF Workshop
Aug 89	NEACT Summer Conference, Roger Williams Coll., RI	New England Association of Chemistry Teachers
Aug 89	South Dakota Education Association	
Aug 89	SDEA Convention	South Dakota Science Teachers Assoc.
Summer 1989	NEACT Summer Conference, Rhode Island College	New England Assoc. of Chem. Teachers
Fall 1989	South Carolina Science Teachers Annual Meeting	
Fall 1989	Plattsburgh NY	Woodrow Wilson Found.
Fall 1989	Regional ACS meeting Winston-Salem, N.C.	

Fall 1989	Purdue University	Class
Fall 1989	Waco Texas	CAST
Fall/Wint 89	Potsdam	BOCES
Sep 89	Tennessee Eastman Co.	TEC
Oct 2, 1989	RVGS	Roanoke City Schools;
Oct 19, 1989	Clay High School, South Bend, Indiana	Clay High School Science Department
Oct 27, 1989	Ames HS	
Oct 89	SERMACS Winston-Salem	
Oct 89	St. Mark's HS, Newark, Delaware	Delaware Teachers of Science Annual State Conv.
Oct 89	Oregon Sci. Teachers Fall Conference, Salem, OR	
Oct 89	MAST Conference	
Oct 89	Siena College	State Science Teachers Association
Oct 89	Flowing Wells HS, Tuscon, AZ	AZ Chemistry Teachers Assoc.
Nov 15, 1989	Grand Valley State Univ.	Coalition for Science &
Nov 18, 1989	RVGS Science Teachers	Blue Ridge Assoc of
Nov 89	NCSTA, Charlotte	
Nov 89	MD Assoc. of Sci Teachers Conference, Ocean City	MDAST
Nov 89	Baylor U., Waco TX	Science Teachers Association of Texas
Nov 89	CESA 10 office, Chippewa Falls, WI	CESA 10
Nov 89	University of Wisconsin Oshkosh	
Nov 89	S.D. Science Teachers Assoc.	

Dec 89	Salem High School, Salem, MA	North Shore Science Collaborative Chem. Group
Dec 89	St. Marks HS	Annual Chemistry Weekend
Dec 89	Chemical Educators Association	
Winter 1990	Northern Kentucky Univ.	Local Chemistry Alliance
Jan 90	Miami Dade Comm Coll Teachers Alliance	Dade County Chemistry
Jan 90	North Kentucky University	Chem Teachers Meeting
Jan 90	Plumerville AR	COOP
Jan 90	Miami Dade Comm. Coll.	Chemistry Alliance
Feb 3, 1990	Columbus Ohio, Statewide Science Teachers Conf. Department of Education	Science Education Council of Ohio and Ohio
Feb 3, 1990	Columbia, OH SECO Convention Education	Science Education of Ohio & Ohio Department of
Feb 9, 1990	Stark County Local Schools, Canton OH	Stark County Local Schools
Feb 10, 1990*	Hoosier Association of Science Teachers, Inc., State Convention	Indiana Academy of Chemistry Teachers
Feb 10, 1990	HASTI, Indianapolis, IN	Ind. Alliance of Chem Teachers
Feb 26, 1990	Interface Conference Tan Tara	Dept of Elem. & Sec Ed.
Feb 90	High School of Engineering and Science, Philadelphia, PA	High School of Engineering and Science
Feb 90	Fort Wayne	NE Indiana ACS;
Feb 90	Educational Service Center, Illinois	ESC #7
Feb 90;	University of New Orleans	NOTOCHEM

*Joint presentation with next entry.

Feb. 90	Indianapolis at state science convention	Indiana State Science Teachers Assoc.
Mar 1, 1990	TIE Workshop, Jefferson City, MO	Missouri Chem Counsel Central MO State Univ.
Mar 7, 1990	Siena College	
Mar 9, 1990	Detroit	Detroit Area Apple Computer Show
Mar 10, 1990	Cincinnati, OH	ACS
Mar 17, 1990	Phillip Exeter Academy	NH Science Teacher Assn.
Mar 90	USD 233 Inservice	
Mar 90	Memphis State University	Science Association of TN
Mar 90	Franklin HS	
Mar 90 (twice)	Collingswood HS, NJ;	So. Jersey Teachers Affiliate ACS
	MSTA Confernce, Arrowwood MN	MSTA
Mar 90	Science Assoc. of TN meeting, Memphis State University,	SAT
Mar 90	AP Chemistry teachers network meeting, Long Island	
Mar 90	Huntsville HS	Huntsville Sci. Teachers
Spring 1990	Mills College	Preservice training
Spring 1990	Palisades (PA)	HS school
Spring 1990	Bremerton Elementary School, Bremerton WA	ESD-114
Apr 10, 1990	Wethersfield HS, CT	CT State Dept. of Educ.
Apr 20, 1990	Middlesex Community Coll.	STARS
Apr 21, 1990	Lincoln HS	Northern Chem Teachers Assn
Apr 21, 1990	ACS HS Teachers, Indianapolis, IN	ACS HS Teachers Cm

Apr 23, 1990	Trumbull HS, CT	CT State Dept. of Educ.
Apr 25, 1990	S.M. South	Chemistry Educators Association of Greater Kansas City
Apr 26, 1990	Siena College	
Apr 26, 1990	Shawnee Mission West HS	Shawnee Mission Public Schools
Apr 28, 1990	Coll. St. Elizabeth, NJ	ACS - No Jersey Sect
Apr 30, 1990	St. Elizabeth College, Madison NJ	ACS
Apr 90	Minnesota Science Teachers Spring convention, Alexandria MN	NSTA
Apr 90	Lahsme HS	Baltimore County Bd of Ed - Sci Department
Apr 90	NYC	Association of Independent Schools
Apr 90	Kansas Association of Teachers of Science;	
Apr 90	Bishop Kenny HS	Diocese of St Augustine
Apr 90	ACS Boston,	New York City Science Teachers
Apr 90	Boulder HS	Apple Computers
May/Apr 90	State of Mississippi	NSF
May 5, 1990	Northwest Missouri State Mergville, MO	Univ. Science Teachers of Missouri
May 5, 1990	Fairoaks Holiday Inn, Fairfax, VA Conference	Virginia Association of Science Teachers' Spring
May 5, 1990	VAST conference (used ACS person)	VAST
May 12, 1990	Brownsville ISD, Brownsville TX	BISD
May 15, 1990	Danbury HS, CT	CT State Dept. of Educ.

May 24, 1990	Siena College	
Jun 4, 1990	Roundrock ISD	Roundrock ISD
	Roundrock TX;	
Jun 18, 1990	Davidson College	Davidson College Chem Dept
Jun 90	The University of South Dakota Summer Program for Chemistry High School Teachers	
Jun 90	Highland Park HS	District
Jun/Jul 1990	Manila Philippines	University of Santo Thomas/ St Paul College of Manila
	Colorado State Science Convention, Colorado School of Mines	CCTA
	Woodrow Wilson HS	Science Dept
	Dover-Sherborn HS	
	Chamberlain High School Supervisor	County Science
	Chem Teacher in-service	
	Caddo Magnet HS	Caddo Parish School Board

Appendix III

Date, Location, and Sponsor of
Workshops Planned by Lead Teachers

Appendix III

Date, Location, and Sponsor of Workshops Planned by Lead Teachers

Aug 90	Honolulu, HI	
Aug 90	St Augustine HS	
Aug 90	Hunter College at the Chem Institute	NYC UFT Teachers Consortium
Aug 90	Great Falls, MT - Orientation Week	School District #1
Aug 90	Niceville High School	
Aug 90	Central HS, St. Joseph MO	
Summer 90	SUNY Oneonta	Woodrow Wilson Foundation
Summer 90	Butler University	Woodrow Wilson Foundation
Summer 90	University of Houston	Woodrow Wilson Foundation
Summer 90	University of Honolulu	Woodrow Wilson Foundation
Sept 90	North Tahoe High School	
Sept 90	U of Alabama	Birmingham; Ala. Science Teachers Association
Sept/Oct 90	Idaho Falls, ID	ACS Idaho Section
Sept 90	University of Alabama at Birmingham	Alabama Science Teachers Association
Sept 90	Mesa District Center	
Sept 18,1990	Waren Technical HS	
Sept 29,1990	University of Pacific, Stockton CA	
Fall 90	Hewlett HS	Hewlett Woodmere SD
Fall 90	Overland HS or Cherry Creek HS	
Fall 90	Kirkwood High School	
Fall 90	Glenbrook South H. S.	"Chem West"

Fall 90	Univ of Missouri - Rolla	ACS - South Central MO
Fall 90	Purdue	Indiana Assoc of Chem Teachers
Fall 90	Franklin HS	
Fall 90	Lansdowne HS	Baltimore County Board of Education
Fall 90	University of Wisconsin, Oshkosh	
Fall 90	Central PA area	Dutch Country Alliance in Chemistry
Fall 90	Indiana (locations to be determined)	Indiana Association of Chemistry Teachers
Fall 90	Memphis City Schools	Memphis City Schools
Fall 90	ACS Pensacola Section	
Fall 90	Esc. County Sci Teachers Inservice	
Fall 90	Philadelphia Science Teachers Assoc. of Science Teachers Convention	
Fall 90	Teacher Education Center	
Fall 90	Plano ISD, TX	
Fall 90	Owensboro, KY at KSTA state meeting	KY Science Teachers Association
Fall 90	Dallas	
Fall 90	St Law College (tentative)	
Fall 90	LSTA, ASIS	
Fall 90	Orange County Public Schools	Secondary Science
Oct 90	Oregon Sci. Teachers Fall Conference	
Oct 90	HS or Southwest State University	Southwest Educational Cooperative Service Unit
Oct 13, 1990	N. VAST meeting Fairfax VA	
Oct 90	University of Florida	Woodrow Wilson Foundation

Oct 90	Saranac Lake HS	Adirondack Teacher Center
Oct 90	Wayne County Schools	
Oct 90	Boonville Missouri	
Oct 90	KY Science Teachers Association Meeting	
Oct 90	Wooster College	ACS Wooster Section
Oct 90	University of Tenn.	East TN Ed. Association
Oct 90	Center School District	Center School District
Oct 90	Glenbrook South HS	
Nov 90	Saul High School	Saul High School
Jan 19, 1991	Regis College	CCTA-ACS
Jan/Feb 91	Fort Wayne	NE Indiana ACS
Jan 91	ACS monthly meeting	
Feb 91	Southeastern Wisconsin Science Forum	
Feb 91	Indianapolis-Hoosier	
Apr 91	WSST Convention	Manitowoc, WI
Spring 91	Rochester Section ACS	
Spring 91	Inservice	
Summer 91	UW-LaCrosse	
Summer 91	NSF summer workshop	Charleston, SC
Fall 91	Glenbrook South H. S.	"Chem West"
Date not set	Southeastern Mass. Assoc of Science Supervisors meeting	Southeastern Mass. Assoc. of Science Supervisors
Date not set	Hudson River Valley	STANYS-SE zone
Date not set	Region 18 Education Service Center	
1990-91	Reno HS, Reno NV	

1991	Cinnaminson HS, NJ	
1991	Glassboro State College	
1991	Catholic High Schools	Office of Catholic Schools
1991	Phillip Exeter Academy	NH Science Teacher Assn.
1991	ChemEd meeting, Oshkosh WI	
1991	Florida Association of Science Teachers	

Appendix IV
Papers, Posters, and Computer Shows

Appendix IV

Papers, Posters and Computer Shows

Given:

Feb 15, 1989	MSTA state science teachers conference	
Aug 89	Chem-Inservice for Chem teachers	
Fall 1989	Lawrence Hall of Science International Conference led by Marjorie Gardner	
Oct 89	ESD 105 Yakima WA	Computer Show
Nov 1989	Guildersland High School	
Dec 89	Velva Public School	
Jan 90	Pheasant Run in Illinois	Computer Show
Feb 11, 1990	Hoosier Association of Science Teachers Indianapolis	
Mar 90	Velva Public School	
Mar 90;	Colorado Science Teacher's Convention	
Mar 90	Boulder High School	Computer Show
Mar 3, 1990	Detroit	Computer Show
Apr 90	NYSCTE Section Conv Adams NY	Computer Show
May 10, 1990	Maine Science Teachers	
Jun 1 1990	Jackson ACS Meeting	
	Wayne State College	
	Jacksonville Joint ACS Meeting Jacksonville FL	ACS Florida
	NSTA in Atlanta	
	Memphis State University	Partial fulfillment for graduate course

State University,
Stony Brook

TIE; Jefferson City Computer Show

Inservice Day for Jr/Sr
High Science Teachers for
our School System

various informal computer
meetings

Planned:

July 16-20, 1990	North Cook Ed. Service Center	Teaching a course on creating interactive video lessons
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Aug 90	Neact summer conference	Fairfield, CT
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School year 1990-91	The Town School, SF	Computer Show
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Fall 1990	"Avogadro" (a newsletter for selected areas of FL
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Fall 90	University of FL
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Fall 90	Area Chemistry Teachers Minneapolis	Computer Show
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Fall 90	KST 17
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Fall 90	STANYS
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Fall 90	NYSCTE
---------	--------

Mar 91	Alabama Academy of Science Jacksonville State University Jacksonville, AL
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Apr 18, 1991	WSST convention Manitowoc, WI
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1991	Montana Science Teachers Association
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when I get a videodisc player.

CT science teachers' annual meeting Quinnipiac College, Hamden, CT	Computer Show
--	---------------

NSTA convention, Houston TX

ChemEd 1991

Spring 1991

North White School Corp Computer Show

Summer 1991 Jacksonville University Workshop/course

regional or state science
teachers conference

local ACS program

VA K-12 Sci-teachers
convention, Roanoke, VA

NSTA in Houston

Appendix V
Comments for Workshop Leaders

APPENDIX V

Comments for Workshop Leaders

Survey Question:

How could the workshop leaders continue to assist you?

Has anyone figured out how to string together several demos and have the safety procedures, etc. only show at the beginning of the run? [Baker]

Support letter to principal

One day is not enough time for a person to become fully acquainted with the appropriate use of this material

They are, David Brooks has just offered new, updated, faster software.

Continue to send information on updates.

Continued updates and support. Perhaps a newsletter sent quarterly?

More material of this nature, more microscale

Help find access to Mac computers. I used a borrowed set-up from Computer Professionals.

Continue being available by phone as you currently are.

\$ is high for many - suggested making short videos of. Update & expand discs.

I do not need additional assistance. I know I can call if things don't work. They were very helpful.

Find a way to finance the needed equipment.

Keep a willingness to assist when problems develop - I'm a year "behind" due to the lack of hardware - I expect to have problems similar to what others may have encountered already.

I do believe that the "lead teachers" should have been provided with some written "ammunition" to take to their schools to aid in obtaining funding for the hardware. The gift of the software was great but obviously we couldn't show what it would do without the disc player, Mac, etc. I'm truly looking forward to using the materials next year! Thanks! Dave Crane

Availability to answer problem questions as they arise.

Give updated listings of new videodiscs

Unclear at this time but I may need assistance in getting everything connected and running.

Provide samples of presentation sequences/formats and sample of workshop organization. (It was very overwhelming initially)

Help when I get stuck on Hypercard

More training on accessing the labs from Hypercard and putting them in word processor for changes and personalizations

Keep us updated on new and innovative experiments, demonstrations, or ideas.

Keep in contact

They do continue to assist. They keep in touch and continue updating.

It would be nice to get together again, to find out how the others have used it.

After I get my hardware in place, I might need a review on use of materials.

Continue to mail updates and be available for questions when we try to interface with Hypercard when we get our laser player.

Advice and problem solving. Trouble shooting

Send information on new developments

Keep us informed on new or changed materials

Updating materials.

Be available - Additional workshop - other workshop rushed.

Network for presentation ideas

Update price of equipment. Periodically publish a flyer containing ways teachers are currently using the program "Feature a Teacher"!

Keep me posted of changes as well as convince my district about the importance of putting money into science ed for programs like this. I know that's not in your power, just kidding about it.

Letters of support for grant proposals to purchase laser videodisc, computer, printer, and present programs.

1) Be available as I learn things & need more phone assistance. 2) Upgrading software. 3) Offer advanced workshops for those using the materials.

Tell me how to copy them, we have video players & computers, but cannot afford Disc Player.

Update on uses and programs designed for the videodiscs

The recent offer of computer software will be helpful if and when a Macintosh computer becomes available to me.

Once I get my own system, I'll need to make contact with someone like Dr. Brooks to iron out the bugs.

By assisting to purchase a disc player

Hope they are at Chem ED 91 - would like to get more skilled with computer interface.

The precautions are overdone and will scare off new Chem teachers. Include more sound.

Answer questions on use of materials and new applications.

General news of improvements, new uses tried by others

Get funding to do workshops

Sponsor a newsletter (twice a year) or write J. Chem Ed article featuring creative uses of Doing Chem

Be available for questions & assistance.

Continue as Dr. Brooks is doing.

Promote a variety of video aids.

Respond to questions as they arise. (I don't doubt they are willing to do this)

Keep us up to date on any new developments

I have only received one letter from my workshop leader. I have not received any software which was promised.

Keep me updated with respect to computer software for program.

By communicating about different experiments they have tried and giving any suggestions needed to handle problems that may arise.

Put sound on the disc.

I need to know better what to do with the Mac software. I can't get it to work by myself. I appear not to have proper additional software. My Hypercard isn't the right kind and no word processor I have can access the written material. Let's discuss this by phone. [Short]

Work with administration to have videodisc players & Macs in classroom

A newsletter with tips, suggestions, updating

Send any update materials!

Help me find groups to present the materials to. [Snyder]

Keep us updated with new materials

Ideas on new ways of presenting the material

I don't understand how to use Hypercard; need and interface

Help us find funding to purchase a Macintosh. In our district only 1 is used in the central office. (small rural district)

Retiring June 1990. Will help as needed.

Please keep me updated on additional or modifications on the experiments. Do you send out 'errata' notifications to kit owners?

Keep upgrading the content of the Hypercard stack.

This fall will afford an opportunity to share the materials.

Perhaps a letter to the district in support of purchasing necessary equipment.

Updates (as done)

I simply need time to get the equipment to use Doing Chemistry

Send follow-up info and other uses

Periodic mailings on new info., software, etc. Perhaps a phone no. to call with questions (1-800...)

I am working with Pat Noel in some institute presentations.

Write to sources we identify to help set up workshops

Availability and prices of disc players and Macintosh computers.

I've been very satisfied and pleased with their help and availability.

Updates of materials, newsletter, lead teacher additional contributed activities.

Do teachers know who we are and that we are available for workshops?

The recent material sent was great.

Appendix VI
Comments to the American Chemical Society

Appendix VI

Comments to the American Chemical Society

Survey Question:

Is there any way that the American Chemical Society can assist you?

Need a laser disk player

Sponsor a summer workshop for the head teacher regarding Doing Chemistry.

Funding for next fall's workshop

Continue to produce new materials, and support training workshops.

I am starting to have difficulty get my discs to search.

More material, more hypercard stacks on various topics, fund Dr Brooks on more projects at UN Lincoln

Fund workshops!

Provide funds for a videodisc player.

Do you have brochures advertising "Doing Chemistry"?- I could use them for a conference this fall. [Brown]

Encourage local ACS groups to help raise money to purchase the videodisc player for those who are the workshop leaders.

Presentation is difficult because equipment hard to move around in the state - local chapters could help.

I would like to have the videodisc material on VHS for easier access and use.

Environmental reports

Provide new chemical demos

No, Ken Chapman has been great.

Provide supporting documentation to my district to convince them this is a good investment.

Training workshop for learning to access labs from Hypercard and to modify text, sending letters of availability to each county science supervisor

Teachers are reluctant to put on workshops but do enjoy attending and using the demonstrations in their own classes. If we could compensate them, they may be more willing.

Help sponsor workshops

A newsletter with tips on presenting & updates on project.

Putting more sound in the Doing Chemistry and doing laser discs on specific topics.

If the lab activity Guide for the lab activities were in Appleworks, it would be much easier for me to edit the lab activities.

Develop videodisc presentations for class use to demonstrate dangerous or expensive reactions (ex. thermite, potassium in water, H_2/O_2 balloons ignited)

I greatly appreciated the loan of the videodisc player when I did not have one.

Quicker delivery of orders

Letters of support to administrators

Supply a laser disk player

Procurement of microscale lab supplies and Macintosh hardware

Support the initial workshop for more new lead teachers.

You've been doing a great job. I appreciate all the efforts but more elementary & middle school is needed.

More workshop - more assistance! Help us find companies who would donate video disc players.

Provide financial support to do local/state workshops

This program should be part of a methods course at the college level. Science methods courses need to be improved.

Help convince the importance of physical science ed to administrators and school districts.

Letters of support for grant proposals to purchase laser videodisc, computer, printer, and present programs.

Produce a more extensive periodic disc.

Continue producing high quality videodiscs to help teach difficult concepts using labs or real life visuals.

Grant money to buy a disc player so we could share the wealth.

Compile a list of presenters that people can contact at the local level.

Do you have any good deals on Macintosh computers?

The local chapter of the Memphis ACS has sent me notification of meetings that they have felt might be of interest to science teachers even if they are not members. I have appreciated this. I have attended some of their meetings and would appreciate the extension of this type of "guest" service.

By giving grants to purchase videodisc player

Teach me how to use Hypercard and integrate it with the videodisc player.

They provided me with brochures on Doing Chemistry which I distributed at workshops. Keep us informed of new laser videodisc programs being developed.

Produce something on videodisc on polymers/radiochemistry.

LCD display for overhead projector presentations.

The Idaho Section here is very co-operative!

Production of videodiscs on specific topics in chemistry - particularly things that can't be done in the classroom.

Make more hardware available. A typical school can not afford the materials.

By continuing its support and programs to science teachers. In comparison to other fields, there is little out there for us.

Write letters of support for what we are doing.

ACS should provide 'loaner' videodisc players to at least allow its sections to review 'Doing Chemistry', or to allow workshop participants to borrow one until the 'paper-work circuit' allows them to obtain one. Example - I attended a workshop in October. By the time I got the player I ordered - May 1990- my enthusiasm was waning somewhat.

Provide minigrants to provide inservice or to buy videodisc player.

Keeping in touch; letting me know of potential needs for workshops

Provide a newsletter/network of "Doing Chemistry" activities, sample lessons etc from teachers who have developed creative applications.
Funding to travel to outlying areas to share Doing Chemistry individually or with small numbers of teachers. Workshops are generally not funded when the numbers are too low.

Keep informing us of future developments.

Continue the support.

Continuation of updated materials. Possibly another get together! Share info!

Promote and provide more videodiscs and software

Write a newsletter of positive uses of 'Doing Chemistry' to justify expense for computer and videodisc player.

The workshops were well organized. The material is excellent. Could you convert from videodisc to VCR? Application nation-wide would increase.

Develop additional discs as the need arises.

Produce more videodiscs in Chemistry. Some topics such as Acid rain, Consumer chem, forensics, environmental Chem, etc.

Advertisement

Professional improvement. Sponsor a workshop like the ICE ones only in my area - Texas/Louisiana/Arkansas.

1) They could offer a player at wholesale price. 2) They can PROMPTLY fill orders. They are very poor at doing this.

Letters of support; any funding

Keeping the workshop leaders informed about any new developments or workshops that might be helpful.

Make more student-oriented materials

Make more videodiscs for teaching chemistry. We see lots of disks available for biology, some for earth science, several for physics, and four for Chemistry. It's a great media!

More projects, inform local sections

Have College types see this! Their students going into Education need it!!

Put me on ChemCom mailing list and send back issues.

Help with procurement of videodisc players. Write letters to school systems to emphasize that videodiscs are essential technology to today's classroom

Suggest ways to own a videodisc player

Do additional videodiscs.

I'd like to apply for a grant to give workshops for Chem teachers in the summer of 1991 in Manila, Philippines.

A possible grant to purchase necessary equipment

Keep us informed of new developments using Doing Chem

"Mini-grants" to supplement purchase of discs, etc. (preferably not matching fund).

Equipment

Periodic table disk is great & Doing Chem is a big success. Keep up the good work. Are there plans to do demonstrations on video? I would be happy to assist with that.

Work with Science Methods teachers at colleges

I don't know the extent of their resource.

Would it be possible to develop materials for IBM compatibles?

Keep up support.

Support for local funding for more teachers to get videodisc equipment

Perhaps ChemUnity, Journal of Chemical Education, C & E News, and ChemMatters could be used to publicize the availability of Doing Chemistry Lead teachers for workshops.

Maybe encourage through mini-grants some programs.

If the plans to get a videodisc player fall through I will need some assistance in getting one.

Appendix VII
General Comments of Lead Teachers

Appendix VII

General Comments of Lead Teachers

Survey Question:

Please make any other comments that you have on any aspect of Doing Chemistry or the workshops.

Many teachers don't have the time or expertise to play with the new technology and/or to gather all necessary parts to make it work. However, this is the usual problem with all new technologies- as more videodiscs on other topics are made and the uses expand people will make time to learn more. I'm on the technology committee at school and will be putting more energy into workshops, etc. next school year.

I would not hesitate to do a workshop, if I could receive additional in-service (or summer workshop) on Doing Chemistry.

It is a great concept and well put together. My only delay in using the material is the fact that I have not been teaching for the last year. However I will be starting work again next Fall and will know better then how valuable and effective the discs are.

Very well organized and thorough. I simply haven't had time to arrange any workshops yet.

We are purchasing more videodisc players, which will increase our use of Doing Chem in classrooms.

Last summer I went through every experiment's video & write-up. I am a 20 year teaching veteran but I still learned a lot.

Very well received by the young inexperienced teachers who are teaching chemistry with minimal qualifications.

Need more of these projects, super idea, more demos, more labs, put Shakishiri's books on laser disc and hypercard, ICE demo's on hypercard, more sponsorship for rural teachers (money and release time)

Continue to offer the workshops- there is a need. You'd get more state & local follow-up if there were some mechanism for funding additional workshops presented by Doing Chemistry participants.

I will be creating a Project Seraphim workshop that will feature Doing Chemistry as well as the Periodic Table videodiscs this summer at U.W. Madison for fellowship! It will be presented at the BCCE in August in Atlanta.

I have tried hard to acquire a videodisc player. The school district will not purchase one because of tight budget problems. The local car dealer is willing to loan me one for only a week, but it has no remote or automatic frame finder. The state science coordinator initially thought he could come up with the funds for a player and workshops but failed to do so. The University of Maine has a videodisc player and holds Fall and Spring workshops for area chemistry teachers. That will be my next try. I may have to purchase one with my own funds.

The Doing Chemistry videodiscs are so valuable in the classroom. We are in transition - building a new science wing and hiring a science coordinator. Then hopefully we will be able to purchase needed equipment like videodisc players and achieve the full benefit of Doing Chemistry

A very valuable resource.

A group of "Doing Chemistry" teachers will try to make arrangements for the other teachers in the state to video portions of this for their own use. I will also present portions of this to middle school teachers at the fall teacher program in our district.

I appreciated the workshop, but have had two new courses in science this year. I used some of the experiments for advanced chemistry and they made some presentations to the sixth graders. These went over very successfully. I will be trying more micro experiments. I appreciate the lab hints for each experiment. I plan to use several additional experiments next year. Doing Chemistry has been very helpful.

Since I do not have access to a videodisc player, I have lent the discs to a colleague with a Mac for the summer. I have kept the print material. At least is being used.

We will introduce a new chemistry next year. I believe the purchase of the videodisc will play an important part in the new chemistry course, by using Doing Chemistry.

I have been asked to give Doing Chemistry and I have not been able to solicit workshops as I have been unable to acquire the equipment needed. I have lent my kit to various people and helped them set up workshops. John Wass of Western Branch High School [Norfolk VA?] has been especially interested in this program.

The workshop was excellent but should be only a starting point, not an ending. Doing Chemistry should be added to, as time goes on, with new discs and cards for additional material. This program should continue - certainly computer usage is growing and videodisc player availability is

increasing. Perhaps Doing Chemistry could continue as a branch of Project Seraphim or some other ACS related computer activity.

Excellent material. I am looking forward to putting it to good use.

The workshop was a tremendous experience for me, and other organizations should support activities such as this.

Since we have not had the equipment, I cannot give much feedback. However, I have succeeded in getting the school to agree to purchase the equipment - videodisc player, Mac computer, etc. this summer. Then I can use it and give workshops to others.

Summer '89-90 I made the kit available for the entire county to preview. During the year I loaned out the kit and plugged it every opportunity I had. Unfortunately, most of the year I was computerless. The laser disc player I transported in my car back and forth as needed. That was the best I could do. Next year, however, watch out! My principal and county (Jack Greene, sci-supervisor) are behind me and the program.

The workshop was great. I will for many years spread the word. I have and will continue to invite teachers in and "demystify" them.

I am very pleased to have received the Doing Chemistry materials, but by receiving it in December I am having difficulty getting necessary materials & equipment purchased because we do this in October and December. I have hopes of doing more in terms of workshops, etc.

The workshop I took was excellent. The training workshop could be improved by spending more time on accessing the written materials on the computer. This is the only area I have had much problems with even though I have installed the appropriate word processor software on my hard drive. I feel there is a great need for personalizing the labs/demos and I have been minimally successful at doing this. Perhaps the new materials I received this week will allow me to do this. Perhaps the written instructions could be provided to this end. The Doing Chemistry materials are excellent. I have taught for 26 years and still, every time I sit down, I learn new things.

Since my school's videodisc player was stolen 10/89, it has taken a long time to set up time at Columbia U to make a VCR tape. All the tapes, papers and demos to be shown in Aug '90 at the NYC UFT teachers consortium

It is difficult to get equipment to run workshops and to get the workshops funded.

Excellent program. The only drawback is cost of videodisc player for individual schools.

Dave Brooks is great - He continues to be very supportive and helpful.

The young teachers I showed Doing Chemistry to were impressed with the materials and spent much time looking at various lab activities. Even the experienced teachers were looking at the experiments and were finding useful variations for their classrooms. I personally have not previewed every experiment, I intend to during the summer. I have made the disks available to any University-Oshkosh student teacher for their benefit. (They are kept at Oshkosh West.)

The workshop provided adequate time for using the disks/materials but not the computer interfacing capabilities. Actually if I had a MacIntosh in my school I would have practiced with it and felt better about its usefulness. Now I guess I will explain the computer interface possibilities but not demonstrate them.

In my district, everyone who is teaching Chemistry is a BS chemist, so teacher training *per se* is not an issue. I plan to use segments in my classroom next year (I'm teaching an Honors Chem course rather than all ChemCom next year) as prelab/postlab exercises because I think they are outstanding.

I have borrowed a videodisc player from our district's Media Center. This year has been very high pressure with a heavy schedule for me. I have worked 70+ hours per week just trying to do a good job. I need more time to use the Doing Chemistry materials. I see lots of interesting and worthwhile ideas that I hope to put into practice in the future. It is a hassle to obtain a TV and to find the time to really utilize the Doing Chemistry Video-Tapes.

Two weeks after the workshop in Memphis, my husband died of a massive heart attack. I am trying to complete this school year on "reflex action" and 31 years experience. While it is not a large or complex estate, I am the executor, and most of my "spare" time has been consumed by bankers, lawyers, etc. Only now am I beginning to think about doing anything beyond the daily demands. I'm sorry that I have not "plunged in" and really worked at getting the Doing Chemistry program operational. Maybe by this fall I can tell you more about my plans.

The material is excellent to help new teachers. When students missed a demonstration - this program saves teacher time - the returning student can view the video to make up work.

I enjoyed the workshop very much; however, I've had little or no time to develop the activities. I had a new baby born this year in addition to a 3 year old and my time has been very limited. I hope to completely preview the discs this summer.

The material is Super. The population density is low in Montana and large numbers of Chemistry teachers are not close at hand. My future workshops will include Jr Hi and middle school teachers.

I see these discs as primarily useful for teacher training (i.e. MSU) and as inservice training (i.e. the ISD).

Presentation was excellent. Dr. Brooks was well prepared and an excellent presenter.

I really feel the workshop was outstanding, but I have not had the time to sit and review the materials. The equipment is in another part of the campus and I can only get access to it after school. Hopefully, they will allow me access during the summer. Please contact me again in the future. By Sept. I hope to have properly reviewed the materials and begun preparations for an inservice. Thank you - Linda Henika

Push this! It is very important to train our Chemistry teachers! (in-service)

This is the most useful resource tool for science (Chemistry) teachers I have ever seen. It supplies the kind of information that new teachers have no access to. Those are labs and demos. I think more of the labs should be converted to microchem experiments. Again I have the highest praise for this program.

I wrote an unsuccessful grant proposal for a computer, printer, and laser videodisc player last school year. My school has not provided any help with equipment. I recently purchased my own personal Macintosh but have no laser disc player yet. There appears to be interest in 'Doing Chemistry' in this area, but disc players are rare.

There is a need to sponsor with stipends for the teacher in each county.

Wish I could use it more - no videodisc really hampers me.

Please write a sequel grant to: 1) Offer more workshops for more chemistry teachers throughout the country. Teachers will only use new materials that they have seen work well. 2) Place hardware in each school system, so that teachers can go for individualized in-service or training using the materials. Ex.- A3500 complete Mac, Videodisc player, cables set up with Doing Chemistry in the microcomputer center - (Must log in how many teachers are involved using the system.) 3) Many teachers are afraid to do labs or do not know how. The "Doing Chemistry" disks can help more classes participate in laboratory situations, because the teachers will feel more comfortable with the material.

Workshop was great, inspirational, confidence building. Implementation has been difficult due to a very tight fiscal budget. We are a group of small independent parochial schools, the only stumbling block is the video disc player need. Film or video cassette we can handle. I really wanted to implement this program and would do so; the work would be fun.

I've used two of the experiments and three of the demo's in writing the bonding and molecular geometry topics for "Source Book", a part of the project "Chem Source". "Doing Chemistry" was referenced in both and given credit as the source of the labs and demos.

It's an excellent program, but video disk players (and MacIntosh computers) are not readily available in most school districts in my area. The intermediate school district has them, but that is not convenient for the majority of teachers. I've tried making video tapes of selected topics and reproducing associated written materials. Many teachers felt those would be more useful to them since a laser-disk player wasn't available, but players were quite easy to obtain.

My district does not have a videodisc player at this time but we are hoping one will be available next school year.

I do demonstration shows, about 40 per year. I also meet with Chem. teachers from the county regularly. About 50 - 100 teachers will use the Doing Chem, provided I can have a disc player.

Doing Chemistry has a lot of great ideas in it, but most of these I have been using for years. The hard copy of this is especially helpful! I've used the videodisc very little and I still am not comfortable integrating this with the Hypercard software. I guess some training in this area would help, but I'm not convinced this would be worth my time. For \$50 one can obtain some outstanding chemistry demonstration/lab books that rival Doing Chemistry. I'm

going to work on learning Hypercard this summer, maybe my attitude will change this fall.

Doing Chemistry was heavily used by my student teacher as she prepared for her demonstrations and student labs. I have recommended to local colleges they acquire this for teacher preparation training.

At present we don't have a video disc player. I have purchased for the district for the 1990-91 year.

Teacher response to the materials is very positive. Many teachers express concern over lack of hardware to use materials.

It was a good experience. I hope to share and use it next year.

Doing Chemistry clearly is a technological approach of the future and being associated with it is exciting. I cannot honestly encourage a teacher to run out and buy the system when many of them are just now learning how to do grades on a 2E. However, the materials must be developed and displayed so when the future becomes the present they will be available.

All we do is show the disc to students. Considering the financial crunch in our state we have 0 funds for updating systems. We do have MAC's for secretarial use but do not in the classroom. I would like to spend more time with these but having one player in the school is somewhat limiting.

Our social studies department has made their equipment available to us. We have just begun to use Doing Chemistry. However, we have been using the text as much as possible to provide demo's. As a science department we are presenting a request to our Chapter 2 Grant committee to acquire our own equipment.

I am still working with the materials and will be doing some workshops this summer.

I can not find many schools in our area with sufficient computer hardware to make use of the materials.

I was pleased to be contacted by the ACS to attend the workshop over at Mills College last December. The workshop was presented very well, and the materials are just great. Thank you!

The burning of the hydrogen balloon needs to be put back into the videodisc. Teachers viewing the discs would like to have sound with each demonstration. The few that have sound are better received than those without.

I realize that my survey responses may seem that I am indifferent. This is not true. It simply takes time to integrate the Doing Chemistry program into our current curriculum. I am very appreciative of your efforts and all concerned with Doing Chemistry. I will continue to use my materials and share it with as many others as possible.
Thanks, Jim Morgan 5/11/90

I am so busy with teaching and extra-curricular assignments that I have not been able to even view all discs. After school is out - all 4 of chem teachers will view all discs, catalog useful demos, match with our chapters and make available to all of us.

During the time Doing Chemistry was in our building (Jan - June 1989) I used it frequently for ideas, especially demos. A group of students built and used the Seraphim interfaces using the videodisc player and print materials. Doing Chemistry is now available if I order it for 1 or 2 weeks (through our Ed. Service Dept.) but is not readily accessible so I do not use it. Our area is thinly populated and we have only 20 people in our 2 county area who teach chem. Getting enough together for a workshop on the same day is tough. Visitations to individual schools is probably the best way to get the word out in our area.

We have a first year chemistry teacher this year. Doing Chemistry has filled a big gap in his background.

Super material! Our department wants videodisc players for each subject area!

Good promotion but need means of contacting a larger audience.

I had requested last fall that our local ACS might purchase a video-disk player for use by "lead teachers" in our area. That request was not acted upon. I intend to purchase my own unit. Then I will have opportunity to review the materials in the kit, and perhaps do a work-shop or two. I got access to a Mac only in March of this year. The need for training teachers now to the Chemistry classroom will intensify in the next few years. Doing Chemistry materials can help address that need.

I think the program is a very good one. I always need a lead year to use materials very effectively. The one-day session was intense, but very profitable. I have since viewed everything on the discs and am in a much better position to both advise and put into practice.

Our school district has just recently made the videodisc player available. Expect to use it much more in the future.

Doing Chemistry is great! I plan to begin using the program in the fall. I have recommended the program to many teachers throughout West and Middle Tennessee, and several of these have indicated an interest in implementing the program in their respective schools.

The info in the discs are fantastic. We are hindered by not having the hardware or the time to use it properly. We really need more personal help even if we had the hardware in order to set it up and use the discs properly and to their fullest.

I and my chemistry colleagues here have learned how to use the equipment and are becoming familiar with the content of the disks.

I think the videodisc is great for teacher training but what is needed now is a disc showing demonstrations and experiments that because of cost, time, of danger are unlikely to be performed in high school - great to show students!

I really appreciated the opportunity to attend the "Doing Chemistry" workshop. I asked the state to fund two workshops. They used the money for something else. As chairman of NE Ind. ACS, I've planned to give teachers a videocassette copy of the "DOING CHEM" along with a copy of the manual. The local ACS is helping with costs of duplication. The main problem with DOING CHEMISTRY is that most teachers do not have access to a videodisc player.

I am willing to do workshops. I have all the hardware. Any school system in my area can contact me if I am needed.
[Roe]

Doing Chemistry excellent idea; continue to help novice teachers; people enjoy interacting with it; all chemistry teachers from 1 to 30 years experience enjoyed; please include my name on any follow-up units or work; great in rural areas where "big guns" don't come. [Rudiger]

I hesitate when I think of giving workshops, because my conscience tells me I am being a salesman and a party to a commercial endeavor.

The workshop was first class. Dave Brooks and Ed Escudero are two of the chemistry educators whom I admire most.

I really enjoy using the materials. It has helped my classes in the areas of organic and microscale chemistry. I hope to use it even more next year.

When I have demonstrated, there tends to be more fascination with the laser video period than with the DoChem. But more of my audiences have been experienced science teachers. Indiana has a Mentor Program for new teachers. I have been a Mentor for a new chemistry teacher who has only 15 hours of college chemistry training. (I refer to her jokingly as the Tormented.) As a mentor I have found it most helpful to use the laser video to teach her how to do things. It becomes a more "Let's learn things together" of "You explore on your own", rather than my telling her how to do so many things. It has definitely been a time saver when our schedules don't overlap on the busy school days. My student teacher used the disks a lot for ideas and we built the thermistor. It is so much easier to SEE how rather than to READ how. It gave me more confidence I could do it so I was willing to try.

On the workshops: Training was good. But I then had a month time lapse getting a laser videoplayer. And then a 9 month time lapse before I got use of a MacIntosh. I needed training again later and as you see I've never got the Mac materials to work. There are just NO INSTRUCTIONS in the written materials and if you are a new Mac user and dumb, it's very difficult to figure out.

I have found the teachers most interested in Doing Chemistry but very few have any access to a laserdisc player, much less a Mac. I point out and show them how to use the player control and the notebook of materials so that the Mac isn't absolutely required to use the programs. In fact, this year I have usually used just the player without the Mac because the Physics teacher keeps it "tied up". Next year I'll have my own Mac. I think Doing Chemistry is great and am very happy to do workshops in exchange for having my own set.

This was a great workshop! I have used the material with students - sodium experiment. Used with other teachers and one student teacher.

These materials need to be introduced to Methods Teachers at the College level. For one thing their students don't know how to instruct or demonstrate when they come as student teachers.

I have not used the materials very much, but I plan to use them as soon as I can procure a videodisc player.

Since videodisc players are not very available in most schools, it might be better to copy the lessons onto videotape even though the ease of operation is lost. Every school has VCR machines and could more easily use the program. Thanks, M. A. Stemniski

I run workshops for the College Board for AP Chem teachers, and mention this as a resource for labs and demos. - But to

date, have not brought videodisc to workshops as there are so many other aspects of AP Chem to deal with, and 'Doing Chem' is not an integral part of AP Program - Also, the hosting school would not be able to provide laser disc equipment as a rule.

My main difficulty is not having opportunity to use in my classes. That leads to great hesitancy in talking about or recommending to any others.

I would like to see another disk produced. I wish I had easier access to the MacIntosh (or have the software on an IBM or Apple IIe) These other computers are more accessible to classroom teachers & myself. This would make it immensely easier to modify labs.

Love them, but words on screen (over graphics) often difficult to read.

I am very happy with my experience as a lead teacher for Doing Chemistry. I think it is an excellent resource for Chemistry teachers and I enthusiastically recommend it to my colleagues. We have just finished a two-day workshop in Manila using the Doing Chemistry materials (one day). Had no access to a videodisc player so had to tape selected experiments onto Betamax tapes. The program was very well received.

David Brooks has been extremely helpful. He has answered questions, called me with answers & has answered my phone calls. I really appreciate his help!

I have only recently acquired the hardware for "Doing Chemistry". I think it is truly wonderful and we'll use it in the classroom often next year. I had a student teacher this spring but the videodisc player arrived too late to be of much use for her. I plan to offer use of "Doing Chemistry" to my fellow Chem teachers when they have student teachers.

This fall will afford an opportunity to share the materials.

I appreciate being included in the workshop and definitely feel the materials are worthwhile especially for beginning teachers. I feel they should be made available to schools of education for chemistry teacher training.

It's a great idea but the set up is \$ & clumsy. I have been told videodisc players will be obsolete soon???

I used the Doing Chemistry discs and program to convince the district to purchase a videodisc player and Macintosh system for our department. It should arrive in August.

I have been hampered by not having the equipment to use 'Doing Chemistry'. There is a MacIntosh at our school. It may have Hypercard. I made several inquiries within our district about getting a videodisc player and until 1 week ago, I had no success. I now have a man who believes he can get me one. I had a busy Spring outside of my classroom (various Science competitions for students.) I plan to devote several weeks during the summer to getting the equipment and practicing.

Some general science teachers looked through the materials for demo ideas and how to do them.

Stimulating, greatly broadening classroom capabilities, eliminates safety problems, enthusiastically received by students, good for (trained) substitutes to use.

A very good project. The presentations were complete & the training very helpful. Perhaps this should be continued.

Doing Chemistry is a great video and I hope to use it when we get a videodisc player and Mac computer (to be used in my classroom). The videodisc is one more item that we can use to convince our district to invest in more technology.

Valuable material. Fills a need!

I really appreciate this support even though time does not allow me to implement a lot quickly. The materials (especially the discs) are very valuable to me and my students. Thank you much, Robert Waddell.

I felt the workshop was a little brief. The limitedness of the hardware is a real problem in this area. It took me 4 months to get the video disc player alone. Now I hope to be able to present the material to a larger audience.

There is so much material that I have only gone through the written and sections of the video. This summer will give me a chance to study it more thoroughly. Then I can give a better response.

I am excited about the program, but as a new science department chairperson with a new science building being built in a school undergoing accreditation evaluation, I have not yet had time to make a presentation. I have plans to do so this fall/winter.

Excellent materials - well prepared workshop leaders.

I could have used some support to help me get a player. My principal just discovered this technology, 1.3 years after I came back from a workshop in East Lansing all enthused. He is not technologically literate, but now he sees the value

so we are getting 2 machines in my building. Finally I'll be able to use this as a teaching tool and not just a novelty.

Have you tried to contact the Science methods instructors at the Universities? You should. These materials are a most valuable asset to pre-service teachers.

For the 1990 - 1991 school year the science & social studies departments have written a grant for two videodisc players. If & when the players arrive I will make videotapes of certain labs and share these tapes with other chemistry teachers and lab assistants. Through a local funding organization, I will seek funds to offer a two hour workshop. At this workshop I will demonstrate the project. Everything is on hold until the school receives the videodisc player.

Appendix VIII
Miscellaneous Correspondence

Student Affiliates Reach Out With *Doing Chemistry*

by

S. K. Airee & William B. Cate

The University of Tennessee at Martin

In February last year, the authors had an opportunity to see a presentation by Dr. David W. Brooks of the University of Nebraska-Lincoln at a Kentucky Lake Section of ACS meeting and later they read an article 'Doing Chemistry: A Resource for High School Chemistry Teachers' in the Journal of Chemical Education (Volume 66, No. 5, 425, May 1989). This inspired them and others (Salane L. King and Dr. Robert L. Hartshorn) to apply for an Innovative Activities Grant for the SAACS chapter to serve as an outreach of this ACS project. As a result, ten student affiliates of the American Chemical Society at the University of Tennessee at Martin got involved in the ACS project *Doing Chemistry* last fall. The experience was highly rewarding and pedagogic to both the presentors and the viewers, so we decided to share this with other SAACS chapters by writing it up for *the pHilter*.

Doing Chemistry is an ACS project produced with support from the National Science Foundation. Dr. David Brooks at UNL is the project director and Dr. Kenneth Chapman at ACS is the project manager. It was developed from a nucleus of materials compiled by a core of high school teachers and other project staff. The Doing Chemistry kit consists of (1) three videodiscs that provide a database of still and motion images showing in detail the visual elements of 136 experiments and demonstrations; (2) four discs of Macintosh Hypercard stacks that contain all the print material and facilitate designing lesson plans, handouts, and creating videotapes from the videodisc presentations; (3) two Apple II disks from Project SERAPHIM; and (4) 700 pages of written material.

The University Museum provided the UTM SAACS access to a videodisc player and the Macintosh computer. After the kit arrived from ACS, several SAACS learned how to operate the system. In September, they presented a demonstration for the 12th Annual High School Science Teachers workshop at Martin. Later the authors were involved in presenting the same in conjunction with a chemical demonstrations program at the 10th annual Science and Technology Symposium at Southeast Missouri State University at Cape Girardeau. In January, three student affiliates and the advisor presented the same program at the KLS-ACS meeting in Paducah. During the National Chemistry Week, several high school students and teachers visited the Museum where the SAACS served as the docents. During a high school

seniors day at the campus, our chapter set up a booth at a Student Activities Fair and showed off the computer controlled videodisc demonstrations. At the tenth annual SAACS High School Science Bowl, two hundred students and accompanying teachers were familiarized with the project. Not only did we show them the video images, several 'wet demonstrations' were also done. We know of at least two high schools that have been inspired in going for the project kit and utilizing this image database.

Some of the selections that we used in our presentations were: Methane Combustion in a Can, Combustion of Ethanol, Methane Bubble: a Rising Cinder, Chromate-Dichromate Equilibrium, Iodine Clock Reaction, Ammonia Fountain, Methanol versus water Density. In the stacks, the lessons are divided into various categories such as stoichiometry, chemical bonding, chemical reactions, gases, thermochemistry, acids and bases, equilibrium, kinetics and electrochemistry, computer experiments, etc. Microscale versions of several activities are also presented. One can look at the index by titles or summary descriptions, and access the appropriate material by the click of a button.

There are several unique and practical aspects of this program. One can use the DoChem Hypercard stacks to: find all the project information by lesson title or lesson description; search for any text string (characters) or key words; edit any written information and to print any stored information in its edited or original form for handouts, lesson plans or visuals. One does not have to worry about fast forward or rewind operations as is the case with videocassetts. With videodiscs we can view: frame by frame, in slow motion or fast, freeze and randomly access another demonstration. Thus it's possible to step, play, and scan forward or in reverse.

As an example of a word search in the text, the word methane was used. This word appeared in the following experiments: Bunsen Burner, Reduction of Copper(II) Oxide, Methane Combustion in a Can, Combustion of Ethanol, Volume versus Pressure in a Gas, Air Bubble in Carbon Dioxide, Gas Chromatography. The word Sodium was also searched and it was mentioned in the following experiments: Electrolysis of Water, Preparation and Sublimation of Iodine, Sodium in Water, Electrolysis, Reactions of Copper, The Blue Bottle, Supersaturation, etc.

Along with the Doing Chemistry, we also utilized another videodisc with JCE Periodic Table Stack. Here the periodic chart is displayed on the computer screen and we can click on any element thereby generating a catalog of physical and chemical data along with a window to select from the videodisc the images of reactions with water, air, acids, or, a base.

Some of these reactions are too dangerous for carrying on in the laboratory or in lecture demonstrations. One can access the desired properties data, information about the crystalline structure or the visuals from a tremendous data base. The SAACS and the visitors got a thrill out of watching several of these reactions especially of alkali metals and of magnesium.

We are aware that student affiliates often interact with high schools via presenting demonstrations. They can choose several experiments from this resource and see how these are carried out. Each lesson lists in detail the materials needed, the time required for preparation, the precautions, and appropriate disposal afterwards. The kit may be available in the chemistry departments or nearby school system. Several students these days have a flair working with the microcomputer especially the new Macintosh Hypercard applications program, and may enjoy learning how the videodisc player and the computer interact. At times, copies of the selected lessons may be made onto a videocassett. If all the hardware is not available at one place, one can look for the Macintosh computers in the journalism or English departments, for the videodisc player approach a local car dealer or the military science department.

ALPHA-OMEGA, INC.

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November 19, 1990

Mrs. Sharon Karston
2110 Bayhem S. E.
Kentwood, MI 49508

Dear Mrs. Karston:

Last June you kindly returned to me a survey form that I had sent to your late husband. Your thoughtfulness is much appreciated. You apologized for not noticing the first letter; you need not. I sent the first survey to the school.

Mr. Karston was an excellent teacher. He was one of 200 of the best in the country who were selected to act as Lead Teachers for Doing Chemistry. His death is a loss not only to his family, his students, and his colleagues but also to Chemistry teachers throughout Michigan. Perhaps you can glean some of his excellence from the report that I submitted to the American Chemical Society in the summer. All the Lead Teachers put in an outstanding effort to bring the Doing Chemistry materials to their students and colleagues, Mr. Karston among them.

May you have the support of friends and family in this holiday season.

With fondest regards,

Sincerely,

Arlene A. Russell